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The Social Context of Recycling in Alberta

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ABSTRACT

Although public concern for the environment is at an all time high, sociologists have had little success explaining either individual attitudes towards the environment or individual pro-environmental behaviors. Data from 1,245 adult respondents in the province of Alberta, Canada, shows that very little of the variance in environmental concern or behavior can be explained using the standard predictors of sex, age, education, income, job prestige, rural/urban residence and political party preference. However, 43% of the variance in behavior can be explained by shifting the unit of analysis to the community level, and comparing individual recycling behavior in a community with an institutionalized recycling program to areas without such programs. Three conclusions can be drawn. First, in the absence of a recycling program, environmental concern does not affect recycling. Second, when a recycling program is present in the area, i.e., when the "norm" in the social context becomes pro-environmental behavior, concerned people without access to the program will increase their recycling, while unconcerned people will not. Third, people with access to a recycling program will use it, regardless of their level of concern. The desired pro-environmental behavior is not dependent on individual environmental concern. These results imply that policy should focus on development of behaviorally oriented programs and mechanisms, i.e., attempts to change the social context in which people act, rather than attempting to raise levels of concern or focusing on environmental education. People are both aware of and concerned about environmental problems, but translation of this concern and awareness into behavior requires a context which promotes the behavior. The evidence strongly implies that some social contexts actually decrease the probability that recycling will occur.

Two decades after the Club of Rome published its doomsday predictions, public concern for the environment is at an all time high (Bozinoff & Macintosh, 1989a, 1989b, 1989c; Witherspoon 1985; Rabier et al 1983, 1988). However, sociologists have had remarkably little success explaining either individual attitudes towards the environment or individual environmentally relevant behaviors (Buttel 1987; Van Liere and Dunlap 1980). Our research argues that while most individuals are very concerned with the environment, this concern is translated into pro-environmental behavior (recycling) only in the context of structural social programs. The 1989 introduction of a home "Blue Box" recycling program in Edmonton, Alberta, gave us the opportunity to observe its effects on recycling behavior, and to examine the influence of environmental attitudes on recycling behavior.

Despite increasing media attention given to environmental problems, the study of environmental issues has remained marginal within sociology. Environmental concern and behavior has been studied from an almost "exclusively subjectivist and microsociological [perspective] that could benefit from a more macrostructural orientation" (Buttel, 1987:484). In contrast, the theoretical literature "is largely structural in nature and stands in need of modification in order to incorporate subjectivity and agency" (Buttel, 1987:484). Theoretical works in environmental sociology have not focused on the issues that empirical researchers have studied, and theoretical discourse has not attempted to develop testable theories which could inform empirical research.

Most of the empirical environmental research was undertaken in the 1970s, and reflects a strong ideological and methodological emphasis on the individual. The

influential New Environmental Paradigm developed by Catton and Dunlap (Catton and Dunlap, 1978, 1980; Dunlap and Catton, 1978, 1979a; Dunlap and Van Liere, 1978) went so far as to assume that the existence of a societal level environmental "paradigm" could be shown by the measurement of individual attitudes and beliefs. The societal or macro level was conceptualized as a simple aggregation of individual attitudes, thus implying that individual actions and attitudes determine structure (Alexander 1987).

Recycling

Adoption rates for the sorting and separation of household waste for recycling have been disappointing (De Young, 1986a:436). The massive amounts of waste generated in contemporary North American society are conceptualized as an individual level "behavioral problem of massive proportion" (Jacobs and Bailey, 1982:141). Socio-demographic variables have little influence on behavior (Vining and Ebreo, 1990; De Young and Kaplan, 1986), although there is evidence for a weak positive relationship between recycling and age (Vining and Ebreo, 1990). In an experimental study of the effects of extrinsic incentives (such as payment for recyclable goods) on recycling behavior, Jacobs and Bailey (1982) found that any type of intervention increased recycling behavior over baseline levels, but concluded that bi-weekly informational "prompts" to recycle were the most effective in increasing behavior. While extrinsic incentives generally increased the desired behavior, they were not effective at maintaining or creating "long-term, enduring changes in behavior" (De Young, 1986a:438).

Intrinsic motives such as satisfaction with the "frugality" of recycling may be

important determinants of recycling behavior (De Young, 1986a, 1986b; De Young and Kaplan, 1986). Vining and Ebreo (1990) suggested that knowledge and motivational factors were important determinants of behavior, but found that while recyclers had more information about recycling than nonrecyclers, "nonrecyclers were no different in the strength of their belief that protecting the environment was an important reason to recycle" (1990:68).[1]

The literature on recycling suffers from the same "subjectivist and microsociological" focus that plagues the environmental concern literature. Because the problem is conceptualized as one of individual behavior, research designs do not incorporate structure, thus the "causes" of behavior have been restricted to socio-demographic and attitudinal variables. This ignores the social and cultural context which rewards increasing consumption in a society which judges success by ever-increasing economic growth (Devall, 1980; Leiss, 1976). Defining the problem as an individual behavioral problem has resulted in study of the symptom, rather than the disease. It all fits neatly with the American ideology of individualism: environmental problems are reduced to those of individual behavior, not social structure or organization. This has lead to the futile pursuit of increasingly refined concepts of environmental attitude and behaviors in the belief that more specific measurement will finally demonstrate causal links (Weigel, 1985). The result is a dangerous "restriction of range" problem at both the theoretical and methodological levels in terms of the possible effects of macro structure on environmental behavior.

Environmental concern

When we turn to attitudes towards the environment, empirical explanations for the social bases of individual environmental concern have focused on relationships between indicators of concern and age, sex, education, income, job prestige, rural/urban residence and political ideology. Consensus is that relationships are at best weak, and at worst non-existent (Samdahl and Robertson, 1989; Buttel, 1987; Van Liere and Dunlap, 1980).

In an analysis of 21 empirical studies of environmental concern, Van Liere and Dunlap (1980) found that sex was not related to environmental concern. Urban residents, as well as democrats and liberals, were slightly more concerned than rural residents or republicans and conservatives. There appeared to be a moderate negative relationship between age and concern ($r = -.2$ to $-.4$), and some support for positive effects of education, but very ambiguous results for the effects of income and very small positive effects for occupational prestige (1980:190). While they concluded that social class is positively related to environmental concern, Buttel and Flinn (1978;1974) argue that the variation explained by social class is explained by education alone.

Samdahl and Robertson (1989) found only small correlations between age and three environmental concern scales: $r = -.032, .006, .261$; with education, $r = .207, .326, -.009$; and with income, $r = -.100, -.153, -.118$. Buttel and Flinn (1978) found environmental concern correlated with education, $r = .231$, and with age, $r = -.295$; but Buttel and Johnson (1977) found a correlation with education of only $r = .076$. Dunlap and Van Liere (1978) found their own New Environmental Paradigm displayed very

small correlations with age, r = .09, and education, r = .11.

In summary, there is some support for a weak negative relationship between age and concern, and weak positive relationships with education, urban residence and liberalism (Buttel, 1987:473; Van Liere and Dunlap, 1980). Most studies find little or no relationship between environmental concern and income or occupational prestige (Van Liere and Dunlap, 1980). Even taken all together, these variables rarely account for more than 10 percent of the variance in indicators of environmental concern (Buttel, 1987).

Given the failure of the traditional micro approach in the explanation of both environmental concern and recycling behavior, the task is to identify the conditions under which environmental attitudes can be translated into behaviors. This implies identifying a link between individual attitudes and behavior, and the influence of social programs as social structure.

Social programs and recycling

Certain social structural conditions, operationalized as community differences in recycling programs, increase the probability that the desired behavior (recycling) will occur.[2] While monetary incentives for recycling some goods (such as aluminum drink cans) are well entrenched in Alberta, little opportunity exists for individuals to recycle a wider variety of items such as milk cartons, plastic wrap and tin food cans. Recycling requires substantial individual effort in most areas in the province, and the normative behavior is consumption and disposal rather than recycling and conservation. The curbside Blue Box recycling program available to residents of single family dwellings in

Edmonton institutionalizes recycling at the level of social structure, and has changed both the norms and conditions in the community. Difficult, low pay-off behaviors such as recycling are more likely within a social context which supports and encourages the behavior.

Most social contexts, urban or rural, actively discourage the widespread performance of most pro-environmental behaviors. Individual resources such as environmental concern and education cannot easily overcome the structural barriers acting to decrease the probability of pro-environmental behavior. However, if the macro-structural context is changed (i.e., if a mechanism for recycling is provided) the probability of the behavior will increase because the effort required on the part of any single individual decreases. For example, if households were provided with boxes in which to place items for recycling, and these boxes were placed out with the regular garbage pickup, the number of different items that individuals recycled would probably increase, because it would require relatively little effort on any one person's part. Further, if the program is regular, it creates a new norm of recyling within that social context. Although the literature has found very little (Van Liere and Dunlap 1980; Buttel 1987), there is good reason to think that individual resources such as environmental concern and education may enhance the effect of the social context on behavior, thus indicating an interaction effect between individual resources and social context as they affect behavior. An empirical test requires variation in the macro-structural properties thought to condition the behavior, in this case community-based recycling programs.

Within this framework, several hypotheses can be formulated:

Hypothesis 1: Because most individuals report very high levels of environmental concern, indicators of environmental concern will display low correlations with both socio-demographic and behavioral variables.

Hypothesis 2: Average levels of recycling will be very low in rural areas due to the lack of support in the social context. Levels of recycling should be higher in urban areas, and considerably higher still in urban areas with institutionalized recycling programs.

Hypothesis 3: There will be an interaction effect between socio-demographic indicators and macro-structural conditions, rather than a main effect. (If socio-demographic characteristics of age, education, income and job prestige have any effect on recycling behavior, the effects will be the strongest in the urban area with a recycling program.)

Hypothesis 4: Environmental concern has no direct effect on recycling, except in the urban area with the recycling program.

Methods

A random probability sample of 1,245 adult respondents was drawn to represent residents of the province of Alberta, Canada. The sampling frame was divided into three major areas: the city of Edmonton, the city of Calgary, and the rest of Alberta, primarily rural. The sample enhanced our ability to study Edmonton's recycling program and to compare it to areas where recycling programs had not been put in place. Indexes of dissimilarity, computed by comparing sample data to Statistics Canada data for Alberta show that the sample adequately reflects the characteristics of its population (Kinzel and Odynak, 1990). Fifty-one percent of the sample were male and 49 percent were female. The average age was 41.13 years, and sixty-one percent of were married. Fifty-six percent were employed full-time, while approximately 11 percent were employed part-time. About 12 percent of the sample listed "keeping house" as their primary

employment status. The average number of years of schooling for the entire sample was 13.31 years, and average individual income was between $36,000 and $38,000 (Kinzel and Odynak, 1990:9).

Measurement of concepts

To operationalize macro social structure, the province of Alberta was divided into three areas. The first was rural and small town areas, considered as one area (ALBERTA). The second was a major urban centre with a population just over 600,000 and no recycling program (CALGARY), and the third was a major urban centre of about 600,000 with an ongoing curbside recycling program (EDMONTON). The two ecological variables, city and house type, each have unique meanings in this context. Edmonton is the only community with a recycling program (the "Blue Box" program), where respondents place their recyclable goods out for regular pickup with their garbage. At the time of the survey (March, 1989), only single family dwellings in Edmonton had access to this program. Therefore the interaction term between Edmonton and single family dwelling (BLUEBOX) isolates those households with access to the recycling program.

To test the hypothesis that environmental concern affects behavior only in a community which provides a means for the behavior to occur (Hypothesis 4), a three-way interaction term was created between environmental concern, Edmonton residence and dwelling type. Interactions between concern and the other communities were also tested. High concern was coded as zero, making this relatively larger group the reference group.

The three way interaction term (BLUECONC) took on the value of one for *low concern* residents in Edmonton in single family homes.

Environmental concern was operationalized as the response to the question "How concerned are you about the state of the earth's environment?" Recent survey data (Bozinoff & Macintosh, 1989a, 1989b, 1989c; Witherspoon 1985; Rabier et al 1983, 1988) shows that distributions of environmental concern tend to be highly negatively skewed, with frequently more than 90 percent of a given sample in the highest "concern" category (Derksen, 1990). The most meaningful distinction may be a dichotomous one, between those who report concern with the environment, and those who are relatively neutral or report low levels of concern. The similar pattern observed in many different data sets may indicate that extreme environmental concern has become such a widespread phenomenon that it is now virtually invariant in most western societies. These very skewed distributions may also be the cause of the low correlations and insignificant regression slopes found in many multivariate analyses of environmental concern. This may account, in part, for the failure of empirical investigations to identify the causes of environmental concern at the individual level. This constancy of concern suggests that explanations for variation in pro-environmental behavior must be sought at the macro, or community level, rather than in differences in individual attitudes. When environmental concern (CONCERN) was treated as the dependent variable (Hypothesis 1), it was left in its original 7 point scale form (7 = Very Concerned).

Recycling (RECYCLE) is a ratio level variable which was the sum of the number of different types of items which were reported as recycled in respondents' households

at the time of the survey. This included beverage cans and bottles, newspapers, household plastics, milk cartons, food cans, other paper products, compost material, motor oil, glass jars and glass.

Age is the actual number of years, derived from respondents' responses to what year they were born in, and education is the actual number of years of education the respondent had completed. Income is the respondent's individual income, and job prestige is operationalized using the 1981 Socioeconomic Index for Occupations in Canada (Blishen, Carroll and Moore, 1987).

Results

On average, Alberta residents share the same high levels of environmental concern expressed by other populations. The mean level of concern is 5.94 (out of 7), with a standard deviation of 1.35. As shown in Figure 1, the vast majority of respondents (89 percent) show some degree of concern about the environment, with almost half (46.9 percent) being "very concerned". One hundred and forty-one (11 percent) report neutral or low levels of concern.

With 89 percent of the sample in the positive end of the scale, it is expected that Hypothesis 1 predicting low correlations between CONCERN and socio-demographic and environmental variables will be supported. Analysis of variance showed no significant differences in mean levels of CONCERN between the three regions (EDMONTON, CALGARY and ALBERTA) ($F_{2,1236} = .088$, $p < .915$). On average, all respondents are "quite concerned".

As predicted (Hypothesis 1), CONCERN does not correlate strongly with the traditional predictors of age, sex, education, income, job prestige, political affiliation or rural/urban residence. Further, CONCERN has a low correlation with recycling ($r = .07$) (Appendix A).

General environmental concern was regressed on age, sex, education, income, job prestige and rural/urban residence (EDMONTON, CALGARY, ALBERTA) and RECYCLE.[3] OPTIMISM over the likelihood of solving the earth's environmental problems in the next ten years was also included as a predictor. While the literature is equivocal on the strength (or existence) of relationships between socio-demographic variables and environmental concern, we would expect to see a negative relationship between concern and age, a positive relationship with education, and little or no relationships with income and occupational prestige. As well, no sex differences are expected.

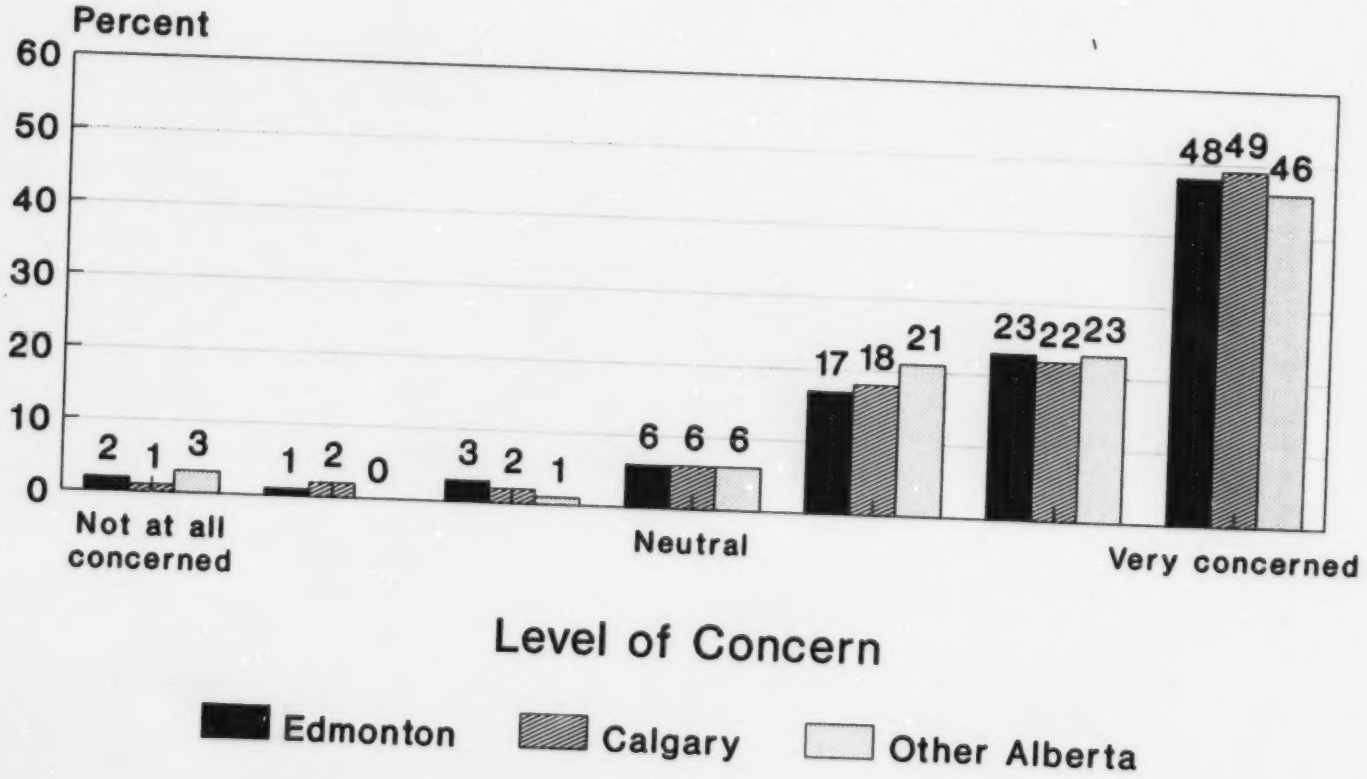
Table 1 shows that less than 1 percent of the variance in CONCERN is explained by the independent variables, and the F test ($F_{10,826} = 1.32$, $p < .218$) shows that none of the slopes differ significantly from zero. The adjusted R^2 for the regression is only .004. In other words, we are unable to explain variation in environmental concern using these variables. There are no collinearity problems.

Urban dwellers are much more likely to recycle cans and bottles than individuals in rural or small town areas (ALBERTA). About 72 percent of both Edmonton and Calgary respondents said they recycle cans and bottles, while only 59 percent of the rest of the province did ($x^2 = 25.39$, $p < .001$). This significant difference is likely related

Figure 1

Overall Concern with Earth's Environment

Edmonton, Calgary and Other Alberta



ANOVA shows no significant differences between groups. Mean level of concern is 5.9 on 7 point scale. N = 1,245.

to the relative scarcity of bottle return depots in small towns and rural areas. This lends support to the hypothesis that institutionalized mechanisms for pro-environmental behavior are an important determinant of that behavior.

Even in the absence of a curbside recycling program, over half (53.5 percent) of the Calgary respondents said they recycle newspapers, while only 36 percent of the rest of the province do so. There are more newspaper recycling bins to which individuals can take their newspapers in Calgary than in the rural areas. A full 72 percent of Edmonton respondents recycle their newspapers (differences are significant, $x^2 = 103.40$, $p < .001$). On an individual item basis, Edmontonians are about 16 percent more likely than Calgarians, and 22 percent more likely than rural residents, to recycle plastics ($x^2 = 68.53$, $p < .001$); and about 30 percent more likely than either group to recycle milk cartons, food cans, other paper products (x^2 test shows all differences significant at $p < .001$). These are all items which can be placed in the Blue Boxes for pickup. There are no significant differences between groups in recycling composting material.

As expected, there are explicit differences in the average number of items recycled by region (Hypothesis 2). Analysis of variance shows that Edmontonians recycle about 3.75 different types of items, while Calgarians recycle about 2.12 items, and other Alberta about 1.84 ($F = 167$, $p < .001$).

Within Edmonton, there appears to be a "carry over" or "generalization" effect of the Blue Box program to people without access to the program. When an analysis of variance is done selecting only respondents from across Alberta in multi-family dwellings (none of whom had been provided with a Blue Box), Edmontonians still recycle more

Table 1
Slopes, Standard Error and Significance level for multiple regression of CONCERN

VARIABLE	SLOPE (b)	Standard Error (b)	p-value
AGE	-.0047	.0031	.6966
EDUC	.0129	.0182	.4803
INCOME	-.0019	.0066	.7697
PRESTIGE	.0000	.0000	.8900
SEX	-.0225	.0951	.8128
OPTIMISM	.0097	.0248	.6966
RECYCLE	.0095	.0599	.8748
CALGARY	-.3533	.2070	.0883
CALGRECY	.1745	.0896	.0517
EDMONTON	-.1536	.2072	.4589
EDMRECY	.0383	.0707	.5877
Adjusted R^2 = .00376, Standard Error = 1.19952			
$F_{10,826}$ = 1.315, Signif F = .2175			

than their counterparts in other parts of Alberta. Edmontonians in multi-family dwellings with no access to Blue Boxes recycle about 2.23 types of items on average, Calgarians about 1.90 items, and Other Alberta residents about 1.74 items ($F_{2,259} = 4.02$, $p < .019$).

RECYCLE does not correlate strongly with any but the regional variables. Interestingly, AGE correlates *positively* with RECYCLE ($r = .12$, $p < .000$; $r^2 = .014$) but shows a slight negative correlation with CONCERN with $r = -.07$, $p < .012$; $r^2 =$

.005). Although older people tend to be somewhat less concerned about the environment, they do recycle more -- i.e., their attitudes are less pro-environmental than their behavior. However, the magnitude of the correlations (as indicated by r^2) is extremely small. Age explains about 1.5 percent of the variance in RECYCLE, and less than 1/2 of 1 percent of the variance in CONCERN. This very small effect may be a period effect, given that many of today's older people have lived through at least one war and perhaps a depression, necessitating careful conservation and re-use for survival.

As expected, RECYCLE shows positive correlations with EDMONTON, due to the Blue Box program, and negative correlations with CALGARY and ALBERTA. The only other correlation of note is with education (EDUC), $r = .07$, showing a very weak, but positive, relationship between education and recycling.

We predicted that older people and those with more education would recycle more types of items. Further, although individuals with high levels of concern should demonstrate higher levels of recycling (Dunlap, 1983), our Hypothesis 3 predicts that concern will have no direct effect on recycling behavior, but will demonstrate an effect only in social contexts where a regular, ongoing recycling program is available (single family dwellings in Edmonton).

RECYCLE was regressed on the standard predictors of age, sex, education, income, job prestige and political party. Progressive Conservatives were used as the reference group, with LIBERAL, NDP and REFORM (political party preferences) entered as dummy variables. Environmental concern was included, and the regional variables (EDMONTON, CALGARY and ALBERTA) acted as an indicator of macro

structure. Further, since within Edmonton only single family and side-by-side duplexes have access to the Blue Box program, a dummy variable for HOUSE was entered (single family dwelling = 1).

Since we predicted (Hypothesis 3) that the effect of the socio-demographic variables may depend on structural conditions, the regressions were performed separately for the three regions. Results showed that the slope for education achieved statistical significance only in Edmonton. While the interaction was not strong enough to merit inclusion in the reduced form model, it does provide some support for the hypothesis that personal resources are not strong enough to overcome structural barriers to pro-environmental behavior, but their effect is enhanced by some social structural conditions. As well, results showed a definite interaction for single family dwellings, with this effect stronger in Calgary than rural Alberta, and stronger in Edmonton than Calgary. This makes sense given that individuals in homes have more space for storage of recyclable goods than apartment dwellers, and urban dwellers have more access to recycling depots and bins than rural respondents.

Reduced form model

Sex, income, job prestige, political party and optimism did not contribute significantly to the model. A reduced form model was estimated including age, education, concern, Calgary, Edmonton, dwelling type, and four interaction terms: a two-way interaction between dwelling type and Edmonton (BLUEBOX), a three way interaction between environmental concern, dwelling type and Edmonton

(BLUECONCERN). The two lower order interaction terms between dwelling type and concern (HOUSECON) and between Edmonton and concern (EDMCON) were also included in the model, although both slopes were insignificant.

The correlation matrix shows an expected high correlation between HOUSECON and CONCERN (r=.81), and Edmonton and its two-way interaction term BLUEBOX (r = .697). These are not expected to provide collinearity problems. Since the variables included in the regression have different theoretical reasons for inclusion, they were regressed using a stepwise procedure. As predicted, the socio-demographic variables of age and education have very little effect, accounting for only two percent of the variance in recycling behavior. Environmental concern has no significant direct effect; its slope does not achieve statistical significance, but it is in the predicted direction ($b = -.33$, $p < .048$). The addition of house type (apartment dwellers versus single family dwellings) increases the R^2 to 7 percent, with its slope ($b = .79$, $p < .000$) indicating that people in single family dwellings recycle almost 1 more type of item than apartment dwellers.

The literature predicts that urban residents will recycle more than rural residents, and we see that the addition of the urban area of Calgary does have a small effect, accounting for 5.2 percent of the variance and increasing the R^2 to 11.8 percent. However, the effect of a difference in social context on behavior shows with the addition of Edmonton. The addition of EDMONTON alone provided a significant R^2 change of 24.5 percent, bringing the adjusted R^2 up to 36.4 percent. The interaction term BLUEBOX adds 5.4 percent. The interaction terms BLUECONCERN, EDMCONCERN

and HOUSECONCERN account for less than 1 percent of the variance in RECYCLE. The final adjusted R^2 for the regression is .421. The independent variables together account for 42 percent of the variance in RECYCLE.

Table 2 shows that age and education had very weak, positive effects on recycling behavior, and environmental concern had no significant effects. Age makes a small difference such that a 30 year age difference predicts that the older person recycles about 1/3 more of an item than the younger person. The effect of education was also small: someone with 15 years of schooling will recycle, on average, about 1/2 more of an item than someone with no schooling.

The large differences are between regions. The increased opportunity for recycling provided by an urban context (even one without an organized recycling program) is evident for Calgary respondents, who recycle about .23 more types of items than their rural and small town counterparts. However, the tremendous influence of social conditions on behavior shows in Edmonton, where the social context for recycling is substantially different from the other two areas. Edmontonians in single family dwellings recycle on average about 3 more types of items than Calgarians or other Albertans. Edmontonians without access to Blue Boxes still recycle about .89 more of an item than rural Albertans, and about .66 more of an item than Calgarians. This rural/urban difference in itself is striking, apart from any effect of the Blue Box recycling program. Individuals in non-metropolitan areas do not recycle as much as urban residents. It is possible that rural residents define "recycle" differently than do urban residents. Rural residents are more likely to have to dispose of their own garbage than

Table 2
Slopes, Standard Error and Significance Level
for reduced form multiple regression of RECYCLE

	VARIABLE	SLOPE (b)	Standard Error (b)	p-value
"MICRO" Hypotheses	AGE	.0118	.0028	.0000
	EDUC	.0306	.0137	.0256
	CONCERN	-.2822	.3291	.3914
"STRUCTURAL" Hypotheses and Interaction terms	CALGARY	.2400	.1063	.0241
	EDMONTON	.8348	.1711	.0000
	HOUSE	.3659	.1263	.0039
	BLUEBOX (1 = single family dwelling in Edmonton)	1.9919	.1959	.0000
	BLUECONCER (1 = LOW concern, single family dwelling in Edmonton)	-1.677	.5694	.0033
	HOUSECON	.1107	.3797	.7706
	EDMCON	.5341	.4593	.2452
	Intercept	.7193	.2558	.0050
Adjusted R^2 = .4251, Standard Error = 1.3068 $F_{10,990}$ = 74.95, Signif F = .000				

are urban dwellers, and thus may "reuse" items that urban dwellers would throw away or set aside for a recycling bin.

Further evidence for the hypothesis that environmental concern has an effect on behavior *only* in a social context which increases the probability of that behavior (Hypothesis 4) is shown in Table 3. When controlling for the independent variables in the model, environmental concern has no direct effect on recycling behavior, but it does

have an effect in single family homes in Edmonton -- i.e., those people with access to Blue Boxes.

Edmontonians recycle more types of items, on average, than other Albertans or Calgarians. The fact that apartment dwellers in Edmonton (who have no access to Blue Boxes) recycle more than single family dwellers in the rest of the province may indicate that the publicity from the Blue Box program has a "spill over" effect in Edmonton. The publicity may spur even those with no direct access to recycling programs to seek out their own sources for recycling. The number of items recycled by people in multi-family dwellings in Edmonton (about 1.64 items on average) suggests they are probably doing so with pop cans, bottles and newspapers, which are more readily recycled than milk cartons and food cans.

Table 3 shows that house type is an important determinant of recycling behavior, suggesting that storage space may have a stronger effect on behavior than environmental concern. People in single-family homes tend to recycle more than people in multi-family dwellings. Further, the effect of social context on behavior is such that the desired behavior occurs even in the absence of environmental concern. Unconcerned people with access to Blue Boxes still use them to recycle. These individuals recycle about 2.3 items, on average, although this is less than their concerned counterparts who recycle almost 4 different types of items.

In order to see if it was possible to explain variation in recycling behavior further, the regression was re-estimated, but restricted to those with access to Blue Boxes. In this regression age and education were significant at the .05 level of

Table 3
Predicted mean number of items recycled*

HOUSING TYPE	ALBERTA	CALGARY	EDMONTON	
			CONCERN LOW	CONCERN HIGH
MULTI-FAMILY	.75	.98	1.58	1.58
SINGLE FAMILY	1.12	1.35	2.26	3.94

*Table 3 includes predicted values for RECYCLE controlling for environmental concern, age, education, income, occupational prestige, dwelling type and location.

significance, and concern at the .01 level. The slopes for age and education were extremely weak (age: $b = .016$, $p < .032$; education $b = .094$, $p < .027$). The interaction with concern was strong, with low concern individuals recycling almost 1 item less than concerned respondents ($b = -.954$, $p < .007$). In conclusion, there is a weak positive relationship between recycling, age, education and environmental concern, but these variables together account for only 5.74 percent of the variance in recycling behavior, which shows again that individual characteristics do not explain differences in recycling.

Conclusion

Several important conclusions can be drawn from this analysis. First, there is little to be gained from attempts to explain differences in environmental concern. *If* the important question is why some people are concerned and some are not, analysis should be cross-cultural to get variation in levels of expressed concern. As well, it may be important to obtain an alternate measure of concern. Asking people how concerned they

are inevitably results in highly skewed distributions and invariably low correlations. However, it is possible that we are accurately measuring environmental concern in western cultures, and the lack of variance reflects valid, high levels of concern in the population.

Some strong conclusions can be drawn from the analysis of recycling. First, in the absence of a recycling program, environmental concern does not affect recycling. People who are concerned about the environment do not recycle any more than those who are not concerned, *when there is no structural, or institutional mechanism for them to do so*. Second, when a recycling program is present in the area, i.e., when the "norm" in the social context becomes pro-environmental behavior, *concerned* people without access to the program will increase their recycling, while unconcerned people will not. Third, people with access to a recycling program will use it, regardless of their level of concern. The desired pro-environmental behavior is not dependent on individual environmental concern. People who are not environmentally concerned will still recycle, if they have access to a mechanism for doing so. It is perhaps enough that environmental concern is a cultural constant; it does not need to be a personal commitment as well. An individual's environmental concern will enhance the effect of an existing institutionalized structure, but it will not overcome the barriers presented by the lack of such a structure. High levels of concern further increase the desired behavior for both people with and without access to the program. The lack of influence of standard socio-demographic and

economic predictors supports the hypothesis that social structural factors are an important determinant of pro-environmental behavior.[4] The above demonstration that social structural factors are important determinants of pro-environmental behavior has important implications for environmental sociology. We have attempted to provide a much needed perspective which utilizes a macrostructural focus but also incorporates subjectivity and agency (Buttel 1987). However, our analysis does not engage in a truly macro-structural analysis which would locate environmental problems in the wider constitution of western society. As well, recycling programs aimed at changing individual action are ultimately ameliorative, not transformative. Their success comes in part because they fit with the dominant liberal ideology and its concurrent focus on individualism; programs of this type allow individuals to feel that they are making pro-environmental changes in their lives without really changing anything but the colour of the garbage can. Indeed, the current global trend is towards *increased* consumption, but with a new focus on consuming "green" products, or purchasing from companies with good environmental track records.

As Catton and Dunlap suggested in their original critique of social theory (Catton and Dunlap, 1978), the ideological biases of western society seem to have prevented the empirical environmental sociology literature from focusing on the big, important questions of the relationship between human beings and their environment. The more critical literature in environmental sociology has swung too far the other way, forgetting that individual behavior is affected by social structure, and that both types of analysis provide needed insights.

A potential focus for future research is to examine whether the interaction between environmental concern and social structural conditions holds for environmental behaviors other than recycling. Results from this study imply that policy makers would best put their money and emphasis into organized programs and mechanisms, i.e., changing the social context in which people act, rather than attempting to raise levels of concern or focusing on environmental education. People are both aware of and concerned about environmental problems, but translation of this concern and awareness into behavior requires a context which promotes the behavior. Indeed, the evidence strongly implies that some social contexts actually decrease the probability that recycling will occur.

ENDNOTES

1. This study would have been strengthened by looking at how knowledge and attitudes interact to produce pro-environmental behaviour -- i.e., under what conditions do knowledge of recycling, and pro-environmental attitudes translate into pro-environmental behaviour. However, the structural homogeneity of the sample (all households in the same city, no difference in opportunities for recycling), as well as its small size (87 nonrecyclers and 110 recyclers) would not have supported this type of analysis.

2. A crucial component of action is individual effort (Alexander, 1987), and individuals are free to exert effort in order to act or change a situation. However, in many situations or contexts the effort required to act is great, thus making the probability of the action occurring very low. Some social circumstances (differences in macro structure or context), increase the probability that individual effort can result in the desired action.

3. If a relationship exists between CONCERN and RECYCLE it may be a reciprocal relationship. This cannot be tested adequately with this model since the model cannot be identified. To identify the model, items would be required which predict CONCERN, but not RECYCLE and vice versa. The regional variables of EDMONTON, CALGARY and ALBERTA would serve to uniquely predict RECYCLE, but as the multiple regression analysis shows, there are no predictors of CONCERN, let alone unique predictors.

4. Participation rates in the Blue Box program do differ across area within the city. In Edmonton, inner city areas with Blue Boxes have lower participation rates and generate a much lower volume of recyclable material than higher income areas. Residents in the upper middle class areas (mostly the southwest part of the city) have inundated city hall with requests for larger blue boxes and to increase the range of items eligible for recycling. City officials say they have been overwhelmed with both the volume of material generated in these areas, and the care taken in preparing waste for recycling. (Personal communication with Ron Ralt, Acting Project Coordinator, Blue Box Program, City of Edmonton, July 31, 1990). Perhaps, rather than individual level socio-economic indicators affecting behaviour, a broader value system is at work. Areas of the city with high volume and participation rates are also areas with very high property values. People in these areas are willing to pay for the privilege of a beautiful residential environment, and perhaps much more willing to participate in anything which protects or improves the quality of that environment.

BIBLIOGRAPHY

Alexander, Jeffrey C., Giesen, B., Munch, R. and Smelser, N.J.

1987 The Micro-Macro Link. Berkeley: University of California Press.

Arbuthnot, Jack

1977 "The Roles of Attitudinal and Personality Variables in the Prediction of Environmental Behavior and Knowledge". Environment and Behavior, Vol 9(2):217-232.

Blishen, B.R., Carroll, W.K. and Moore, C.

1987 The 1981 Socioeconomic Index for Occupations in Canada. Canadian Review of Sociology and Anthropology. Volume 24(4):465-488.

Bozinoff, Lorne and MacIntosh, Peter

1989a "Environmental issues greatly concern Canadian public". Gallup Canada, Inc.: Wednesday, October 25, 1989.

1989b "Government scolded for perceived inactivity concerning environment". Gallup Canada, Inc.: Thursday, August 3, 1989.

1989c "Environment and taxation most concern Canadian public." Gallup Canada, Inc.: Monday, July 21, 1989.

Buttel, Frederick H.

1987 "New Directions in Environmental Sociology". Annual Review of Sociology, 13:465-88.

1978 "Environmental Sociology: A New Paradigm?" The American Sociologist, 13:252-256.

Buttel, Frederick H. and Flinn, William L.

1978 "Social class and mass environmental beliefs - a reconsideration". Environment and Behavior, Vol. 10(3):433-450.

1978 "The Politics of Environmental Concern: The Impacts of Party Identification and Political Ideology on Environmental Attitudes". Environment and Behavior, Vol. 10(1):17-36.

1977 "Conceptions of Rural Life and Environmental Concern". Rural Sociology, Vol. 42(4):545-555.

1974 "The Structure of Support for the Environmental Movement, 1968-1970". Rural Sociology, Vol 39(1):57-69.

Buttel, Frederick H., Gillespie, G.W. Jr., Larson, O.W. III, Harris, C.K.
1981 "The Social Bases of Agrarian Environmentalism: A Comparative Analysis of New York and Michigan Farm Operators". Rural Sociology, Vol 46(3):391-410.

Buttel, Frederick H. & Johnson, Donald E.
1977 "Dimensions of Environmental Concern: Factor Structure, Correlates, and Implications for Research". Journal of Environmental Education, Vol. 9, No. 2:49-64.

Buttel, Frederick H. & Larson, Oscar W., III
1980 "Whither Environmentalism? The Future Political Path of the Environmental Movement". Natural Resources Journal, Vol 20:323-344.

Catton, William R., Jr.
1980 Overshoot. Urbana: University of Illinois Press.

Catton, William R., Jr. & Dunlap, Riley E.
1978 "Environmental Sociology: A New Paradigm". The American Sociologist, 13:41-49.

1980 "A New Ecological Paradigm for Post-Exuberant Sociology." American Behavior Scientist, 24:15-47.

1983 "What Environmental Sociologists have in Common (whether concerned with 'built' or 'natural' environments)". Sociological Inquiry, 2/3:113-135.

Derksen, Linda A.
1990 "Environmental Concern: A Motherhood Issue for the 90s?". Paper presented at the 1990 Canadian Sociology and Anthropology Association meetings, May 25-20, 1990, Victoria, British Columbia, Canada.

Devall, Bill
1980 "The Deep Ecology Movement". Natural Resources Journal, Vol. 20, April:299-322.

Dunlap, Riley E.
1975 "The Impact of Political Orientation on Environmental Attitudes and Actions". Environment and Behavior, Vol 7(4):428-454.

Dunlap, Riley E. and Catton, William R.
1979a "Environmental sociology: a framework for analysis". In Timothy O'Riordan and Ralph C. D'Arge (eds.) Progress in Resource Management and Environmental Planning. Chichester: John Wiley & Sons.

1979b "Environmental Sociology". Annual Review of Sociology, 5:243-273.

Dunlap, Riley E. and Van Liere, K.D.
1978 "The 'New Environmental Paradigm': A proposed measuring instrument and preliminary results." Journal of Environmental Education, 9 (Summer):10-19.

1983 "Cognitive Integration of Social and Environmental Beliefs". Sociological Inquiry, Vol 53 (2/3):333-41).

1984 "Commitment to the Dominant Social Paradigm and concern for environmental quality". Social Science Quarterly, 65:1013-28.

Dunlap, Riley E., Grieneeks, J.K.; and Rokeach, M.
1983 "Human values and pro-environmental behavior", pp.145-168 in W.D. Conn (ed.), Energy and Material Resources: Attitudes, Values and Public Policy. Boulder, CO:Westview Press.

Gallup Poll (U.S.)
1988a "Priorities for the Next President". November 6, Special telephone survey.
1988b "Environmental Problems". December 1, Special telephone survey.
1984a "Environmental Protection". December 16, Survey #243-G.
1984b "Environmental Protection -- International Comparison". December 17, Survey #243-G*.
1982 "Public Opinion Referendum". October 31, Survey #202-G.
1976 "Issues Important to Voters". October 15, Survey #959-K.

Gray, David B., with Borden, Richard J., and Weigel, R.H.
1985 Ecological Beliefs and Behaviors. Assessment and Change. Westport, Connectictut: Greenwood Press.

Hand, Carl M. & Van Liere, Kent D.
1984 "Religion, Mastery-Over-Nature, and Environmental Concern". Social Forces, Vol. 63(2):555-570.

Heberlein, Thomas A., and Black, J. Stanley
1981 "Cognitive Consistency and Environmental Action". Environment and Behavior, Vol 13(6):717-734.

Humphrey, Craig R.; Bord, R.J.; Hammon, M.M. and Mann, S.H.
1977 "Attitudes and Conditions for Cooperation in a Paper Recycling Program". Environment and Behavior, Vol 9(1):107-123.

Jacobs, Harvey E. and Bailey, Jon S.
1982 "Evaluating Participation in a Residential Recycling Program". Journal of Environmental Systems, Vol 12(2), 1982-83.

Kinzel, Cliff and Odynak, David
1990 "Sampling Report for 1990 All Alberta Study (including the Edmonton Area Study)". Edmonton Area Series Report No. 69. Edmonton: Department of Sociology, Population Research Laboratory, University of Alberta.

Leiss, William
1989 "The Idols of Technology". Paper presented at "Knowledge Societies" conference, October 1989, University of Alberta. (Drawn from Leiss' forthcoming book, *Under Technology's Thumb* (1989), McGill-Queen's University Press.)

1976 The Limits to Satisfaction: An Essay on the Problem of Needs and Commodities. Toronto: University of Toronto Press.

1972 The Domination of Nature. New York: George Braziller.

Meadows, Donella H. et al
1972 The Limits to Growth. New York: Signet.

Rabier, Jacques-Rene, Helene Riffault and Ronald Inglehart
1983 Euro-Barometer 18: Ecological Issues, October, 1982. 1st ICPSR ed. Ann Arbor, Michigan: Inter-university Consortium for Political and Social Research.

Rabier, Jacques-Rene, Helene Riffault and Ronald Inglehart
1988 Euro-Barometer 25: holiday travel and environmental problems, April 1986. ICPSR ed. Ann Arbor, Michigan: Inter-university Consortium for Political and Social Research.

Schnaiberg, Alan
1980 The Environment: From Surplus to Scarcity. New York: Oxford University Press.

Samdahl, Diane M. & Robertson, Robert
1989 "Social Determinants of Environmental Concern - Specification and Test of the Model". Environment and Behavior, Vol. 21(1), January 1989:57-81.

Taylor, Dorceta E.
1989 "Blacks and the Environment - toward an explanation of the concern and action gap between blacks and whites". Environment and Behavior, Vol. 21, No. 2, March:175-205.

Tognacci, L.N., Weigel, R., Wideen, M., Vernon, D.
1972 "Environmental Quality - how universal is environment concern?" Environment and Behavior, 4(March):73-86.

Van Liere, Kent D. and Riley E. Dunlap
1980 "The social bases of environmental concern: a review of the hypotheses, explanations and empirical evidence," Public Opinion Quarterly, 44(Summer):181-97.

1981 "Environmental concern: does it make a difference how it's measured?" Environment and Behavior, vol. 13:6(651-676).

Vining, Joanne and Ebreo, Angela
1990 "What makes a recycler? A comparison of recyclers and non-recyclers". Environment and Behavior, Vol 22(1):55-73.

Weigel, Russel H.
1985 "Ecological Attitudes and Actions" in David B. Gray, *Ecological Beliefs*

and Behaviors. Assessment and Change. Westport Connecticut: Greenwood Press.

Weigel, Russell and Weigel, Joan
1978 "Environmental Concern. The Development of a Measure". Environment and Behavior, Vol. 10(1):3-15.

Whitherspoon, Sharon
1985 Technical Report -- British Social Attitudes Survey. ICPSR.

Wohlwill, Joachim F.
1979 "The Social and Political Matrix of Environmental Attitudes. An Analysis of the Vote on the California Coastal Zone Regulation Act." Environment and Behavior, Vol 11(1):71-85.

Appendix A
Pearson Correlation Coefficients

	RECYCLE	CONCERN	AGE	SEX	EDUCAT	INCOME	PRESTIGE	EDMONTON	CALGARY	ALBERTA	BLUEBOX
RECYCLE	1.0000	-.0650	.1178	-.0135	.0728	.0252	.0669	.4950	-.2171	-.3019	.6226
	(1005)	(1004)	(1001)	(1005)	(1003)	(889)	(982)	(1005)	(1005)	(1005)	(1005)
	P= .	P= .039	P= .000	P= .668	P= .021	P= .453	P= .036	P= .000	P= .000	P= .000	P= .000
CONCERN	-.0650	1.0000	.0562	.0222	-.1086	-.0472	-.0858	.0156	-.0012	-.0149	.0000
	(1004)	(1240)	(1235)	(1240)	(1237)	(1094)	(1210)	(1240)	(1240)	(1240)	(1240)
	P= .039	P= .	P= .048	P= .434	P= .000	P= .118	P= .003	P= .584	P= .967	P= .600	P= .999
AGE	.1178	.0562	1.0000	-.0582	-.2436	-.0248	.0023	-.0525	-.0545	.1089	.0586
	(1001)	(1235)	(1240)	(1240)	(1238)	(1096)	(1209)	(1240)	(1240)	(1240)	(1240)
	P= .000	P= .048	P= .	P= .041	P= .000	P= .412	P= .935	P= .065	P= .055	P= .000	P= .039
SEX	-.0135	.0222	-.0582	1.0000	.0877	.4455	.1219	-.0109	.0013	.0100	.0538
	(1005)	(1240)	(1240)	(1245)	(1242)	(1098)	(1214)	(1245)	(1245)	(1245)	(1245)
	P= .668	P= .434	P= .041	P= .	P= .002	P= .000	P= .000	P= .701	P= .964	P= .726	P= .058
EDUCAT	.0728	-.1086	-.2436	.0877	1.0000	.3048	.5666	.0139	.1471	-.1621	.0384
	(1003)	(1237)	(1238)	(1242)	(1242)	(1097)	(1211)	(1242)	(1242)	(1242)	(1242)
	P= .021	P= .000	P= .000	P= .002	P= .	P= .000	P= .000	P= .625	P= .000	P= .000	P= .176
INCOME	.0252	-.0472	-.0248	.4455	.3048	1.0000	.4694	-.0653	.0464	.0231	.0455
	(889)	(1094)	(1096)	(1098)	(1097)	(1098)	(1076)	(1098)	(1098)	(1098)	(1098)
	P= .453	P= .118	P= .412	P= .000	P= .000	P= .	P= .000	P= .030	P= .125	P= .445	P= .132
PRESTIGE	.0669	-.0858	.0023	.1219	.5666	.4694	1.0000	-.0122	.1182	-.1068	.0530
	(982)	(1210)	(1209)	(1214)	(1211)	(1076)	(1214)	(1214)	(1214)	(1214)	(1214)
	P= .036	P= .003	P= .935	P= .000	P= .000	P= .000	P= .	P= .671	P= .000	P= .000	P= .065
EDMONTON	.4950	.0156	-.0525	-.0109	.0139	-.0653	-.0122	1.0000	-.5168	-.5120	.6969
	(1005)	(1240)	(1240)	(1245)	(1242)	(1098)	(1214)	(1245)	(1245)	(1245)	(1245)
	P= .000	P= .584	P= .065	P= .701	P= .625	P= .030	P= .671	P= .	P= .000	P= .000	P= .000
CALGARY	-.2171	-.0012	-.0545	.0013	.1471	.0464	.1182	-.5168	1.0000	-.4708	-.3602
	(1005)	(1240)	(1240)	(1245)	(1242)	(1098)	(1214)	(1245)	(1245)	(1245)	(1245)
	P= .000	P= .967	P= .055	P= .964	P= .000	P= .125	P= .000	P= .000	P= .	P= .000	P= .000
ALBERTA	-.3019	-.0149	.1089	.0100	-.1621	.0231	-.1068	-.5120	-.4708	1.0000	-.3568
	(1005)	(1240)	(1240)	(1245)	(1242)	(1098)	(1214)	(1245)	(1245)	(1245)	(1245)
	P= .000	P= .600	P= .000	P= .726	P= .000	P= .445	P= .000	P= .000	P= .000	P= .	P= .000
BLUEBOX	.6226	.0000	.0586	.0538	.0384	.0455	.0530	.6969	-.3602	-.3568	1.0000
	(1005)	(1240)	(1240)	(1245)	(1242)	(1098)	(1214)	(1245)	(1245)	(1245)	(1245)
	P= .000	P= .999	P= .039	P= .058	P= .176	P= .132	P= .065	P= .000	P= .000	P= .000	P= .

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Appendix A (continued)
Pearson Correlation Coefficients

	RECYCLE	CONCERN	AGE	SEX	EDUCAT	INCOME	PRESTIGE	EDMONTON	CALGARY	ALBERTA	BLUEBOX
HOUSECON	-.0334	.8082	.0615	.0098	-.0602	.0033	-.0395	-.0269	-.0093	.0370	.0723
	(1005)	(1240)	(1238)	(1243)	(1240)	(1097)	(1213)	(1243)	(1243)	(1243)	(1243)
	P= .290	P= .000	P= .030	P= .729	P= .034	P= .913	P= .169	P= .344	P= .743	P= .192	P= .011
EDMCON	.0582	.5944	-.0042	-.0208	-.1066	-.0901	-.0924	.2867	-.1482	-.1468	.1829
	(1005)	(1240)	(1240)	(1245)	(1242)	(1098)	(1214)	(1245)	(1245)	(1245)	(1245)
	P= .065	P= .000	P= .882	P= .464	P= .000	P= .003	P= .001	P= .000	P= .000	P= .000	P= .000
BLUECONC	.0768	.4418	-.0027	-.0061	-.0532	-.0385	-.0395	.2131	-.1101	-.1091	.3058
	(1005)	(1240)	(1240)	(1245)	(1242)	(1098)	(1214)	(1245)	(1245)	(1245)	(1245)
	P= .015	P= .000	P= .925	P= .831	P= .061	P= .202	P= .169	P= .000	P= .000	P= .000	P= .000

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